

# ALPHA<sup>®</sup> WS-709 Solder Paste

Water Soluble; Halide-free

## DESCRIPTION

**ALPHA WS-709** is a completely water-soluble, halide free solder paste which is designed for stencil application in surface mounting processes where aqueous post reflow cleaning is required.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

## FEATURES AND BENEFITS

- **Long Stencil Life:** Exhibits resistance to slumping and drying at temperature up to 21 to 26 °C (70 to 78 °F), and relative humidity extremes. (25 to 75% RH) (>36 hr. stencil life exhibited at ambient conditions)
- **Excellent Water-Soluble Printing Process Window;** very good prints/wipe performance even after 3 hr. exposure at 75% RH
- **High Throughput and Yield;** consistent print volumes at print speeds ranging from 1 to 6 inches/second.
- **Water Cleanable** after double reflow and hot water cleaning
- **Fine-pitch printing;** consistent shape and volume (e.g. 16 mil)
- **Low BGA voiding;** exceeds IPC Class III requirement
- **Low foam** generated from cleaned flux residues in recirculating post-clean equipment

## PRODUCT INFORMATION

<u>Alloys:</u>	63Sn/37Pb, 62Sn/36Pb/2Ag
<u>Powder Size:</u>	Type 3 (25 to 45 µm per IPC J-STD-005)
<u>Packaging Sizes:</u>	500 gram jars, 6" and 12" cartridges
<u>Flux Gel:</u>	Available in 10cc and 30cc syringes for rework applications

**APPLICATION GUIDELINES**

ALPHA WS-709 is especially suitable for ultra-fine pitch applications when used in conjunction with ALPHA CUT stencil apertures as small as 8 mil (0.2 mm) generating well defined print definitions on 16 mil (0.4mm) pitch pads.

**TECHNICAL DATA**

Category	Results	Procedure/Remarks
<b>Chemical Properties</b>		
Corrosivity	Passes Industry Standards on Ionic Cleanliness after cleaning	IPC J-STD-004
Halide Content	Passes Test	IPC J-STD-004
<b>Electrical Properties</b>		
SIR (IPC)	>1.0 x 10 <sup>8</sup> ohms	Pass, 7 days
<b>Physical Properties</b>		
Color and Specific Gravity	Clear, Colorless Flux Residue; 4.6g/cc paste	63Sn/37Pb alloy
Tack Force vs. Time and Humidity	(> 1.6 g/mm <sup>2</sup> )	J-STD-005
Viscosity	90% metal load designated M13 is suitable for all typical stencil-printing applications.	Malcom Spiral Viscometer; ICP-029
Stencil Life	>36 hours	At 50% Relative Humidity
Slump	Pass <0.10 mm (0.25 mm is max per requirement)	IPC J-STD-005 (10 min 150 C)

**PROCESSING GUIDELINES**

Storage & Handling	Printing	Reflow (See Figure 1)	Cleaning
<ul style="list-style-type: none"> <li>• Refrigerate to guarantee stability @ 0 to 10 °C (32 to 50 °F)</li> <li>• Warm-up containers to ambient temperature (over 3 to 4 hours) confirmed with a thermometer.</li> <li>• Maximum Working Range is 25 to 75% RH and 20 to 28 °C (68 to 82 °F).</li> <li>• Do not remove worked paste from stencil and mix with unused paste in jar. This will alter the rheology of the unused paste.</li> <li>• Shelf life of refrigerated paste is 6 months.</li> <li>• Paste can be stored for 2 weeks at room temperatures up to 25 °C (77 °F) prior to use.</li> </ul>	<p><b>Stencil:</b> Recommend Cookson Electronics Assembly Materials ALPHA CUT OR ALPHA FORM stencils at 0.100 to 0.150mm (4 to 6 mil) thick for 0.4 to 0.5mm (0.016" or 0.020") pitch. Stencil design is subject to many process variables. Contact your local site for advice.</p> <p><b>Squeegee:</b> Recommend metal PRESSURE: 1.5 to 2.0 pounds per linear inch of squeegee length (.036 to .048 kg/mm squeegee length).</p> <p><b>SPEED:</b> 1 to 6 inches (25 to 150 mm) per second.</p> <p><b>Paste Roll:</b> 0.4 to 0.6 inches (1 to 1.5 cm) diameter and make additions when roll reaches 0.2 inch (0.5cm) diameter.</p>	<ul style="list-style-type: none"> <li>• Clean-dry air or nitrogen atmosphere.</li> </ul> <p><b>Profile (63/37 alloy):</b> Straight ramp to 220° C peak</p> <ul style="list-style-type: none"> <li>- 0.9 °C/second to 220 °C</li> <li>- 75 seconds (TAL)</li> </ul> <p>High soak 160 °C 220°C peak</p> <ul style="list-style-type: none"> <li>- 1.2 °C/second to 160 °C for 60 seconds</li> <li>- 55 seconds TAL 220 °C</li> </ul> <p>Start with straight ramp design if new oven settings are required.</p> <p>Internal testing has shown straight ramp profile to be most effective for low voiding and solder balling.</p>	<ul style="list-style-type: none"> <li>• Alpha WS709 generates minimal foam while being cleaned in recirculating systems.</li> <li>• The flux residues from WS709 are completely water-soluble.</li> <li>• Recommended rinse temperature 140 to 160 °F (60 to 70 °C)</li> <li>• No special nozzle configurations Ionic contamination levels pass <b>IPC J-STD 001</b> requirement (&lt; 10µg/in<sup>2</sup>) Typical result is &lt;5 µg/in<sup>2</sup> attained with heated solution tested with an Ionograph.</li> </ul>

**REFLOW PROFILES**

**Figure 1**



**RECYCLING SERVICES**

We provide safe and efficient recycling services to help companies meet their environmental and legislative requirements and at the same time, maximize the value of their waste streams.

Our service collects solder dross, solder scrap, and various forms of solder paste waste. Please contact your local sales representative for recycling capabilities in your area or [link here](#).



**SAFETY & WARNING**

It is recommended that the company/operator read and review the Safety Data Sheets for the appropriate health and safety warnings before use. **Safety Data Sheets are available at [MacdermidAlpha.com/assembly-solutions/knowledge-base](http://MacdermidAlpha.com/assembly-solutions/knowledge-base).**

**STORAGE**

ALPHA WS-709 is shipped in thermally controlled boxes and should be stored refrigerated upon receipt at 0 to 10 °C (32 to 50 °F). This will be sufficient to maintain a nominal shelf life. ALPHA WS-709 should be permitted to reach room temperature before unsealing its package prior to use. Room temperature storage for sealed containers should not exceed 14 days. To maintain optimal stencil life performance throughout the product’s shelf life, exposure to room temperature should be limited to 3 days or less.

**CONTACT INFORMATION**

**To confirm this document is the most recent version, please contact [Assembly@MacDermidAlpha.com](mailto:Assembly@MacDermidAlpha.com)**

[www.macdermidalpha.com](http://www.macdermidalpha.com)

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Also read carefully warning and safety information on the Safety Data Sheet. This data sheet contains technical information required for safe and economical operation of this product. READ IT THOROUGHLY PRIOR TO PRODUCT USE . Emergency safety directory assistance: US 1 202 464 2554, Europe + 44 1235 239 670, Asia + 65 3158 1074, Brazil 0800 707 7022 and 0800 172 020, Mexico 01800 002 1400 and (55) 5559 1588

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